Math 10A
Midterm Exam 2.
November 15, 2012
Version B

Instructions:

1. You may use one page of notes, but you may not use any books or other assistance during this exam.

2. Write your *Name*, *PID*, and *Section* (for example A02) on the front of your Blue Book.

3. Write the *Version* of your exam on the front of your Blue Book.

4. Write your solutions clearly in your Blue Book

    (a) Carefully indicate the number and letter of each question and each question part.

    (b) Present your answers in the same order as they appear on the exam.

    (c) Start each question on a new page (separate parts of the same question can be on the same page).

5. You may leave your answers in symbolic form, for example $\sqrt{42}$ or $\ln(6)$.

6. Show all of your work; no credit will be given for unsupported answers.

7. Write your solutions clearly and legibly; no credit will be given for illegible solutions.

Problems:

1. (9 points) Compute the derivative of the given function:
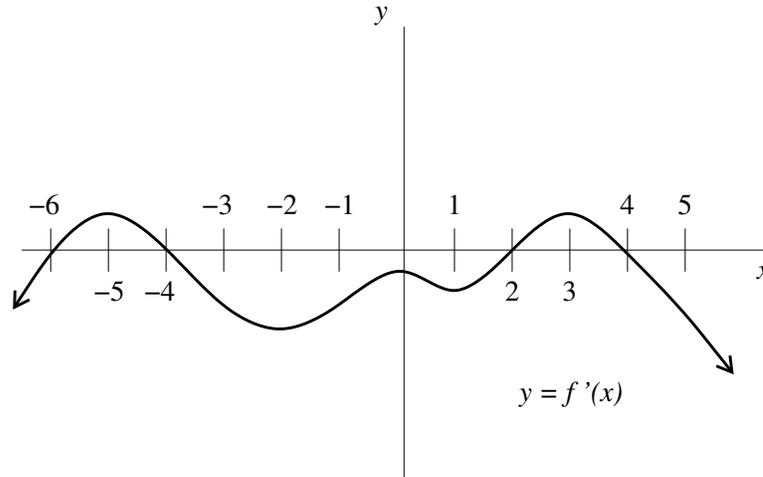
    (a) $y = 25^x + x^{25}$

    (b) $\left(\dfrac{1}{x^4} - \dfrac{3}{x^8} \right) 2^x$

    (c) $y = e^{\sqrt{2x^5 + 10}}$

2. (6 points) Let $h(x) = \dfrac{2x^2}{x+3}$.

    (a) Find the equation of the tangent line to the graph of h at the point with x-coordinate 1.

    (b) List the x-coordinates of all of the points on the graph of h at which the tangent line is horizontal.

3. (6 points) The graph of the ***derivative*** of a function f is given below.

$y = f\,'(x)$

    (a) On which interval(s) is f decreasing?

    (b) On which interval(s) is the graph of f concave up?

4. (9 points) Suppose that $P(t)$ is the population of Calculusville t years after 1950:

    (a) What is the practical meaning of $P'(t)$? Please be sure to give the units of $P'(t)$ in your answer.

    (b) What would it mean if $P'(25)$ were a negative number?

    (c) What does $P'(40) = 0$ mean?